POPULATION SIZES AND POTENTIAL CONSERVATION PROBLEMS OF THE ENDEMIC GALAPAGOS PENGUIN AND FLIGHTLESS CORMORANT

by

Daniel K. Rosenberg and Sylvia A. Harcourt
Charles Darwin Research Station

The Galapagos penguin (*Spheniscus mendiculus*) and the flightless cormorant (*Nannopterium harrisi*) represent 2 of the 5 endemic sea bird species in the Galapagos Islands (Snow and Nelson 1984), the latter being one of the rarest sea birds in the world (Harris 1974) and belonging to a monotypic genus. The breeding range of both species is limited to less than 400 kilometres along the coastlines of Fernandina and Isabela (Harris 1974, Boersma 1977).

Censuses of these two species have been part of the Charles Darwin Research Station's seabird monitoring program since 1977; additional censuses of the penguin were made by Boersma (1977) in 1971 and 1972. Prior to the extraordinary El Niño event of 1982-1983, population sizes were estimated to be 6,000-15,000 penguins (Boersma 1977), and 1,000 adult cormorants (see review in Rosenberg and Harcourt 1986). The effects of El Niño were extremely severe; populations were reduced by approximately 80% for penguins and 50% for cormorants (Valle and Coulter, in press). The rate of recuperation of the two species has been quite different: the flightless cormorants returned to their original numbers after 1.5 years (Valle and Coulter, in press), while the Galapagos penguin has made a very slow recovery, with numbers still estimated to be 70% below the pre-El Niño population. Here, we report on their present status and discuss potential threats.

RESULTS

We censused the coastline of northern Isabela and the entire coastline of Fernandina from 6-13 October, 1986. We counted 719 adult and 28 juvenile cormorants, 464 adults occurring on Isabela and 255 on Fernandina. A total of 546 adult and 38 juvenile penguins were counted, 307 on Fernandina, and 239 along the coastline of Isabela.

DISCUSSION

Cormorants

The number of adult cormorants counted during this census was slightly lower than 1985 numbers, which may only reflect a difference in the accuracy of the census. Using Harris's (1979) and Valle and Coulter's (unpubl. MS) estimate of the accuracy of censusing this species, the population of adults was 800-1,000.

Penguins

The effects of the 1982-1983 El Niño on the penguin population are still apparent. The current population size is still approximately 70% below 1982 numbers. The 9% decline since 1985 noted in this census may be due either to a slight decline in the population or to the inaccuracies of the census. Based on Boersma's (1977) estimate that 12.5%-22.5% of the population is censused using similar methods to ours, the population size is estimated to be 2,400-4,400 adults. Although recovery has been slow, the population apparently increased by ca.50% in 1985 from the previous census (Sept. 1984) including a high percentage of juveniles (Valle 1985), which demonstrates that the current population does have the capacity to increase. It therefore seems probable that sea conditions have not been favourable for breeding since the season of 1985. This view is supported by the fact that the sea temperatures we recorded during this census were often above the 24C that Boersma (1977) believed to be the upper temperature limit at which breeding occurs in the Galapagos penguin.

POTENTIAL THREATS

Before their elimination from the coastline of Isabela, feral dogs were considered a possible factor explaining the lower number of penguins found in 1980 than in 1971 (Harcourt 1980), due primarily to lower numbers in zone 7. However, this area contained the greatest number of penguins for all zones in our and previous censuses and there is no indication that the percentage of the population censused there (zone 7) has increased since the eradication of the dogs in 1981 (Rosenberg and Harcourt 1986). It appears that the penguins are presently safe from the dogs and that their numbers may not have suffered appreciably from predation even in the years when the dogs were there.

Nevertheless, because of the presence of penguins in the diet of feral dogs (33%, Barnett and Rudd 1983), any renewed invasion by dogs could be very dangerous. Feral cats are another potential predator and do occur on the coastline of Isabela (Boersma 1977, Valle 1986, pers. obs.); however, no reports yet exist of predation on penguins by cats. Fortunately the penguins on Fernandina, which represent ca.53% of the entire population, are not threatened by any feral mammals; no introduced animals are known on this island.

At the present time both the flightless cormorant and the Galapagos penguin seem relatively safe. Although the number of visitors to Galapagos is increasing, the habitat of these two species is inhospitable to tourists (Lévèque 1963). Currently, large scale fishing and lobstering do not exist there but if present artisanal methods were to be superceded by commercial exploitation there would be serious threats to both birds through their getting caught in nets and traps (Holthius and Loesch 1967, Hays 1984 for *Spenicus humboldti*) as well as by a possible reduction in the available supply of their food (see Duffy 1983). In view of the potential threats from feral animals and fishing interests, we strongly urge the regular monitoring of these two small and vulnerable endemic species.

This will also aid our understanding of their population dynamics and the influence of the El Niño phenomenon, which so drastically reduced their numbers in 1982-83.

ACKNOWLEDGEMENTS

We thank H. Vargas for field assistance, and the crew of Beagle 4, Wilson Cabrera, Rogel Edilberto and Francisco (Panchito) Moran, all of whom made the census run smoothly. Many thanks to A.C. Valle for discussions about previous censuses, and to M.H. Wilson for helpful comments on an earlier report. This work was funded by a WWF grant to the Charles Darwin Research Station (project no. 1719), and to them we are especially grateful.

LITERATURE CITED

Barnett, B.D. and R.L. Rudd (1983). Feral dogs of the Galapagos Islands: impact and control. Int. J. Stud. Anim. Prob. 4(1): 44-58.

Boersma, P.D. (1977). An ecological and behavioral study of the Galapagos penguin. Living Bird 15: 43-93.

Duffy, D.C. (1983). Environmental uncertainty and commercial fishing: effects on Peruvian guano birds. Biological Conservation 26(3): 227-238.

Harris, M. (1974). A complete census of the flightless cormorant. Biological Conservation 6(3): 189-191.
(1979). Population dynamics of the flightless cormorant. Ibis 121: 135-145.

Harcourt, S.A. (1980). Report on a census of the flightless cormorant and Galapagos penguin. Noticias de Galapagos 32: 7-11.

Hays, C. (1984). The humboldt penguin in Peru. Oryx 18: 92-95.

Holthius, L.B. and H. Loesch (1967). The lobsters of the Galapagos Islands (*Decapoda, Palinuridea*). Crustaceana 12: 214-222.

Rosenberg, D.K. and S.A. Harcourt (1986). Census of the Galapagos penguin and flightless cormorant. CDRS files.

Snow, D.W. and J.B. Nelson (1984). Evolution and adaptations of Galapagos seabirds. Biol. J. Linn. Soc. 21: 137-155.

Valle, C.A. (1985). Reporte del censo cormorones y penguinos alredador de Fernandina e Isabela. CDRS files.
(1986). Status of the Galapagos penguin and flightless cormorant populations in 1985. Noticias de Galapagos 43: 16-17.
and M. Coulter. Present status of the cormorant, penguin and flamingo populations in Galapagos after an El Niño year. Condor, in press.